REMARKS/ARGUMENTS

Objections to Drawings

In the specification, the paragraph at lines 3-10 has been amended to correct a minor editorial problem, to-wit, the number "62". in the specification as filed at line 6 on page 13 has been corrected to the numeral "262."

It is asked that the objection to the drawings be withdrawn. Specifically, the numeral 50 referring to the line of weakness in the bulged section 30 of the rupture disc can be found on Figs. 1, 2, and 5. Reference to the clamping member 62 in the first full paragraph of page 13 of the specification was a typographical error; the numeral should have been 262. A corrected paragraph for lines 3-10 of page 13 is incorporated in this response.

35 U.S.C. § 112 Rejections

Claims 21 and 22 have been cancelled. Therefore, the § 112 rejections have been traversed.

Allowable Subject Matter

It is noted that claims 6, 7, 15-17 were deemed allowable as filed, but objected to as being dependent upon a rejected base claim. Applicant believes that the remaining claims of this application are allowable, over and above those deemed allowable by the Examiner in the first Office Action, particularly in light of the amendments to Claim 1 that now particularly distinguish the invention of this application from the cited prior art references.

35 U.S.C. § 102 Rejection

Reconsideration of the reject of claims 1-3, 5, 8-11, 14, and 18 of the present application as anticipated by the Mozley Patent No. 4,759,460 is respectfully requested. Claims 21 and 22 have been canceled without prejudice or disclaimer, claim 1 has been amended, so that claims 1-20 are presently pending. Claim 1 is in independent format, and clearly distinguishes over the '460 Mozley patent. Accordingly, claims 2-3, 5, 8-11, 14, and 18 dependent from claim 1 are likewise allowable.

Claim 1 is directed to non-fragmenting, forward-acting high pressure relief apparatus. (Pg. 1, l.10). The rupture disc called for by claim 1 has an overpressure receiving face (Drg. Fig. 4, pg. 6, ll. 5, 6) and a peripheral flange section. (Pg. 10, l. 13). A line of weakness extends around a part of the central section and has opposed end regions that define a unitary hinge portion therebetween. (Pg. 11, ll. 16-17). A hold-down member is mounted on and engages the peripheral flange section of the rupture disc on the side thereof opposite the overpressure receiving face of the central section of the disc. (Pg. 10, ll. 20-25). A unitary segment of the hold-down member extends into the inner opening of the hold-down member and engages the hinge portion of the disc in disposition overlying end regions of the line of weakness. (Pg. 10, l. 24; pg. 11, ll. 1-3; pg. 11, ll. 23-24; pg. 12, ll. 1-13). The hold-down member has a rectilinear innermost margin that extends between and merges with opposed end extremities of the line of weakness. (Pg. 10, l. 24; pg. 11, ll. 1-3).

The segment of the hold-down member undergoes deflection in the direction of a forward-acting overpressure force applied to the central section of the disc to absorb and divert a part of the overpressure force away from the portion of the hinge extending between respective outermost end regions of the line of weakness and thereby contribute to prevention of separation of the central section of the disc from the peripheral portion of the disc. (Pg. 16, ll. 18-24; pg. 17, all lines; pg. 18, ll. 1-14).

The rupture disc system of the Mozley Patent No. 4,759,460 does not anticipate the subject matter of claim 1, nor render the claimed combination obvious, even when the '460 patent is considered in conjunction with the teaching of the DeGood, et al. Patent No. 4,512, 491, assigned to the assignee of this application.

First addressing the '460 Mozley patent, the rupture disc unit is a "reverse buckling rupture disc assembly" as out in the claims of the patent, and it is not non-fragmenting, *forward-acting high overpressure* relief apparatus. Reverse buckling rupture discs are designed to open at low pressures causing reversal and are not adapted to protect vessels, tanks, bag houses, and piping associated with such equipment, to relieve excess pressure before the excessive pressure damages equipment, components, or structures where the equipment is in operation. Mozley states that his reverse buckling rupture disc is designed to reverse and open at approximately two-thirds of the maximum rated rupture pressure associated with a vessel or other processing equipment to be protected by the disc. ('460 patent, col. 3, ll. 62-65).

Most importantly though, the support ring 101 of Mozley shown in Fig. 10 of the '460 patent drawings is positioned against and engages the peripheral flange on the downstream side of the disc, whereas in the present the hold-down member is located on the upstream side of the disc. As is apparent from Fig. 11, the arcuate projection 102 does not serve to reinforce the hinge portion of the disc during reversal of the bulged section of the disc. The projection 102 is arcuate so that on reversal of the domed section of the disc, the section that opens may wrap about the projection. ('460 patent, col. 7, ll. 46-54). Mozley explains that a projection having an arcuate outer surface is required because projections having a linear or chordal engaging surface were found to allow the dome to continue to rip along the tab or hinge region and therefore were not satisfactory. Claim 1 calls for the innermost margin 46 of the segment 44 to be of rectilinear configuration, in that an arcuate edge of a projection 102 as in the Mozley patent, would contribute to tearing of the hinge portion of the disc if employed for relief of high pressure energy explosions or overpressure conditions, the very thing that the present invention is designed to overcome.

Furthermore, the projection 102 of Mozley's ring 101 is not designed to undergo deflection in the direction of a forward-acting overpressure force; the projection 102 merely functions as a post for the ruptured section of the disc to wrap around during reversal of the disc rather than opening of the disc in a forward direction. Contact of the central section of the disc of Mozley engages the projections 34 or 102 *only after* the disc has reversed, and not during initial opening of the rupture disc, as in the present forward-acting vent structure.

The Examiner has also made reference to the ring 260 in Fig. 27c of the '460 Mozley patent. The ring 260 is used in the Mozley patent during manufacture of the disc to form an indentation 266 in the dome as shown in Fig. 28c, and the ring 260 is not a component part of the rupture disc. (Mozley's '460 patent, col. 13, ll.39-55; col. 14, ll. 1-11). Thus, Mozley's ring 260 employed only during fabrication of the disc to form an indentation 266 in the disc is not described as being a substitute for the support ring 101 having an arcuate projection 102 as shown in Figs. 8 and 11 of the '460 Mozley patent.

There are substantial and significant differences between explosion vents as represented by the present invention, as compared with rupture discs. These differences may be summarized as follows:

Force parameter	Explosion vent	Reverse buckling rupture disc
Acceleration (dynamic effects)	High	Low
Opening pressure (P stat)	Low	High – e.g., two-thirds of rated vessel withstand pressure
Surface of moving parts	Very high	Very small
Media	Compressible only	Non compressible and compressible
Inertia / Mass	High	Low
Accelerated mass	High	Low
Reverse acting	No	Yes
Force applied to hinge section	High	Low
Discharge capacity	Very high	Moderate

The projection 34 of Mozley's support ring 32, and the projection 102 of support ring 101 are not designed to deform as is the case with applicant's segment 44 for absorption of energy during forward bursting of the disc to prevent separation of the central section of the disc from the peripheral flange section at the hinge portion of the disc.

35 U.S.C. § 103 Rejection

Claims 4, 12, 13, 19, and 20 were rejected as being unpatentable over Mozley '460 in view of the DeGood, et al., '491 patent.

DeGood was cited for its showing of a pair of rupture discs. However, claims 4, 12, 13, 19, and 20 are dependent from claim 1. Claim 1 distinguishes from the disclosure of the '460 Mozley patent for the reasons explained in detail above. Consideration of DeGood in conjunction with Mozley does not supply the deficiencies of Mozley in anticipating claim 1 or rendering the subject matter of claim 1 obvious in view of Mozley. Claims 4, 12, 13, 19, and 20 therefore should be found allowable over the state of the art, even when the teaching of DeGood is considered along with Mozley.

The present application is now in condition for allowance and forwarding of the formal Notice of Allowance of claims 1-20 is respectfully requested. Should the Examiner have any questions, please contact the undersigned at (800) 445-3460.

A 3-month Petition for Extension of Time accompanies this Amendment, along with a check in the amount of $1,020.00 for the petition fee set forth in 37 C.F.R. § 1.17(a). The

Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 19-0522.

Respectfully submitted,

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